

# Islamic work ethics as a key engine of endogenous economic growth

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## Abstract

**Purpose** – God promised pious individuals who obey to His commandments, to increase their economic well-being. Although it is difficult to demonstrate with figures in hand this causality relationship, Muslims must believe in its existence and robustness at both the individual and collective levels, as it is argued in Qur'an and the Prophetic Narration. We aim in this paper to model this positive relationship between Islamic work ethics and economic growth and prove theoretically its existence.

**Design/methodology/approach** – We develop an endogenous growth model very close technically to Lucas–Uzawa model (1988) in which the human capital defined as the individual's skill level acquired through formal education and learning by doing is replaced by ethical capital (piety).

**Findings** – The model proves theoretically that Islamic ethics are a key engine of endogenous economic growth and that the underdevelopment of Muslim populations is due to their low ethical capital (lack of piety).

**Practical implications** – The study recommends some policies such as providing formal religious education at all educational levels (elementary, secondary and higher levels) and promoting ethical values such as piety, sincerity, transparency, etc., through media and cultural institutions. Also, managers could provide courses and training to their workers to teach them Islamic work ethics.

**Originality/value** – This paper is the first to mathematically model Islamic work ethics as endogenous phenomena in socioeconomic systems and study theoretically their contributions to economic growth.

**Keywords** Islamic work ethics, Piety, Ethical capital, Human capital, Endogenous growth

**Paper type** Research paper

## Introduction

Muslim economies are considered behind the non-Muslim ones. However, the debate on the relationship between economic growth and Islam is still unclear. According to some writers and academicians, Islam is an impediment to economic growth in Arab societies (Bendix, 1960). Similarly, Said (1978) and Nafissi (1998) attribute the underdevelopment of Muslim economies to Islam and consider it as a religion that preaches fatalism and hinders economic development. Tessler (2002) concludes that Islam is anti-democratic and hinders economic growth since it vests sovereignty in God as the sole source of political authority. According to Fachini (2007), Islam is incompatible with political modernity and democracy. Conversely, Islamic scholars are unanimous in concluding that the objective of Islamic Law (Maqāṣid al-Sharī'ah) is to raise income and wealth through development in order to promote well-being of all mankind. Many studies are sympathetic toward Islam. Indeed, Gardet (1970) and Sauvaget (1984) cite the golden centuries of the Abbasid who occupied half a millennium (750–1,258) and the century's conqueror of the Umayyad (661–758) to argue that Islam can build a developed economy. In addition, Adams (1976) argued that Islamic teaching and traditions are not opposed to the modern economic methods. According to Sadeq (2006) Islamic economic development is a balanced and sustained multi-dimensional process of



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improvement in the material and non-material well-being of man, involving the enrichment of welfare through advancement, reorganization and reorientation of the economic and social systems. According to [Kamali \(2008\)](#) the Islamic Shari'ah enhances economic growth by encouraging work, production and trade in order to enable people to earn a living. [Ahmad et al. \(2013\)](#) also present Islam as a universal religion that brings economic development and prosperity to all over the world. Similarly, the study of [Lamido \(2016\)](#) argues that Islamic Shari'ah permits everything legitimate needed for economic development. Recently, [Iman and Mohammad \(2017\)](#) confirm that *Waqf* generates economic outputs and realizes sustainable socioeconomic well-being.

On the empirical level, the study of [Kuran \(1997\)](#) conducted in a cross-section of 132 countries shows that Islam negatively and significantly affects economic growth through its effects on investment, education and gender inequality. Using the World Values Survey from 1995 to 2001, [Guiso et al. \(2003\)](#) support the argument that Islam is negatively associated with attitudes that are conducive to economic growth making Muslim countries the most "anti-market". Based on the same survey, [Norris and Inglehart \(2003\)](#) find that Muslims value democracy but differed from western societies on sexual liberation and gender equality, which may explain Muslim underdevelopment countries. According to [Kuran \(2004\)](#), rigid Islamic laws such as Islamic inheritance laws and polygamy are not amiable to economic growth and may explain why the Middle East is lagging behind the western world. The study of [Barro and Mc Cleary \(2003\)](#) on Turkey, Bangladesh, Malaysia and Pakistan concludes that religious beliefs enhance economic performance; however, religious behaviors (attendance of religious services which is higher for Muslim) hinders economic growth. More recently, based on a sample of 20 Muslim countries from 1990 to 2014, [Khalfaoui \(2015\)](#) shows that Islam does not promote economic growth. Similarly, [Campante and Yanagizawa \(2015\)](#) establish evidence for a negative effect of Ramadan fasting on economic growth in Islamic countries. Using Southeast Asian censuses, [Delacroix and Delavallade \(2018\)](#) show that Catholicism is pro-child (increasing total spending on children) which depresses economic growth in its early stages by decreasing savings and labor supply, whereas Islam which is pro-birth impedes human capital accumulation and economic growth in its later stages. Conversely, many other authors establish that Islam is positively associated with economic growth. [Barlow \(1982\)](#) and [Collins and Bosworth \(1996\)](#) found that Islamic economies grow faster than other developing economies. The cross and within-country analyses of [Noland \(2003\)](#) conducted on the Muslim population in India, Ghana and Malaysia does not find support for the argument that Islam is unfavorable to economic growth. [Noland \(2007\)](#), through his study on 70 countries, compared the effect of Islam, Christianity, Judaism, Buddhism and Hinduism on economic growth. He showed that given the level of economic development, Islam promotes economic growth. Using cross-country regression, [Çamlıbel \(2014\)](#) showed that Islam by itself has no impact on economic growth while technological innovation, human development and economic freedom are significant. More recently, the empirical study of [Majeed \(2019\)](#) shows that social capital (measured by solidarity and interpersonal safety and trust index) is a key factor of economic performance in the Muslim countries.

Many other studies focus on the impact of Islamic finance presence on economic growth. While this relationship is still unclear, rare studies in this field argued that the Islamic financial system, with zero interest rate, cannot support economic growth because it leads to lower savings and financial intermediation disadvantage ([Pryor, 1985](#)). However, most studies suggest that Islamic finance has a positive and significant contribution to economic growth because of the high profitability, stability, efficiency ensured by profit and loss sharing (PLS)-based finance. Indeed, [Siddiqi \(1999\)](#) showed that by sharing the risk between lenders and borrowers, moral hazard will have no place in the Islamic banks, and funds will be channeled toward more innovative, prudent and profitable projects. [Almossawi \(2001\)](#) argued that the Islamic banking system will not cause a probable crisis in the economy. For

that reason, in several countries, Islamic banking becomes an essential alternative to the conventional banking system based on interest (Ahmad and Haron, 2002). Also, the financial crisis that started in the United States in 2008 has confirmed that Islamic banking is better than conventional banking (Loo, 2010). Abduh *et al.* (2011) showed that Sharī'ah-based banks' deposits perform better in case of a financial crisis. Using cointegration and Granger-causality approaches, Abduh and Omar (2012) showed a positive correlation between economic growth and Islamic banking in Bangladesh from 2004 to 2011. The study of Cebeci (2012) showed that the Islamic financial instruments *muḍārabah* and *mushārahah* expand welfare, alleviate poverty and contribute to society in terms of social responsibility. Using a panel of Islamic banks from GCC and East Asian countries, during the period 2000–2009, Yusof and Bahlous (2013) found a significant contribution of Islamic banking to economic growth in both the long-run and short-run. Similarly, Farahani and Dastan (2013) showed a positive bidirectional Granger-causality between economic growth and Islamic banking in UAE, Qatar, Malaysia, Saudi Arabia, Indonesia, Yemen, Egypt, Kuwait and Bahrain. Grassa and Gazdar (2014) concluded that Islamic banks performed better than conventional banks in GCC countries and that the private Islamic credits and the Islamic banks' deposits are found to be relevant determinants of economic growth. Lebdaoui and Wild (2016) assessed the correlation between economic growth and the share of Islamic banking in Southeast Asian countries' financial market in terms of assets and deposits. The study shows that the Islamic banking sector contributes significantly to economic growth. Rashid *et al.* (2017) suggest that Islamic banks contributed more effectively than conventional banks to the stability of Pakistan's financial sector during the period 2006–2012. More recently, Choudhury *et al.* (2018) argued that in the presence of *riba*, bank-savings lead to continuous withdrawal from potential aggregate output and a deprivation in resource mobilization, goodly spending and employment generation, causing a contraction of the real economy and a failure to actualize social well-being (*maslaha*). Selim (2019) confirmed this result by showing that Qard-al-Hasan (interest-free loan) based monetary policy increases output and exports, reduces imports, maintains price stability making monetary policy more effective. In addition, Hassan *et al.* (2018) Found that *Takaful* Operators are making a significant contribution toward economic development, human capital development and poverty alleviation in Malaysia, thus making a significant contribution toward the social *maslaha*. It is shown that *Takaful* Operators significantly impact the economic indicators operationalized to capture three broad areas of *Maqasid al-Sharī'ah*: *darurriyyat*, *hajjiyyat* and *tahsiniyyat*. Choudhury *et al.* (2019) argued that Islamic finance, through selecting equity-based financing instruments, should alleviate poverty and attain the well-being criterion and development sustainability goals.

While most scientific research focuses on Islamic economics and finance, the Islamic perspective in management studies is an interesting emerging field. Indeed, many researchers argued that Islamic beliefs, perceptions and values influence Muslim employees' management practices (see Ali and Al-Owaidan, 2008). According to Ahmad (1996), these Islamic values create a conducive work environment for quality management effectiveness. More recently, Sidani and Thornberry (2009) stated that Islamic ethics are central in quality management. Hashim (2010) focuses on Malaysia's business organizations. It finds a significant correlation between Islamic HRM and organizational commitment. Using a sample of 114 managers working in the Pakistani telecom industry, Abbasi *et al.* (2011) found that Islamic values have a positive multi-dimensional impact on managerial business performance of an organization and must be inculcated in organizational culture. Kumar and Rose (2010) have suggested that Islamic work ethics positively affect the innovation capability of employees. Kumar and Rose (2012) showed that Islamic work ethics significantly influences the relationship between innovation capability and knowledge-sharing capability of Malaysian employees. Similarly, Salleh (2012) argued that the Islamic principles of administration positively impact Malaysian business organizations. More

recently, Ghulam *et al.* (2016) suggest that Islamic work ethics positively affect the organizational citizenship behaviors among university employees in Pakistan since Islamic principles urge followers of Islam to provide voluntary support to their coworkers and organization when needed. They also find positive impacts on knowledge-sharing behaviors since Islam encourages followers to acquire and share their knowledge with colleagues and work for the community's welfare. Finally, Mansour and Nimr (2020) found a significant positive effect of Islamic business ethics on employees' competitive advantage in Palestinian Islamic banks. None of the researches cited above ventured to mathematically model Islamic work ethics as endogenous phenomena in socioeconomic systems, neither study their contributions to economic growth. The only theoretical framework of Ben Mimoun *et al.* (2016) has proved that the more committed individuals are to God commandments, the lower are their incentives for corruption, and the higher is the long-run economic growth. The theoretical model shows a minimum level of piety (Taqwa) below which the economy moves away toward an illegal rent-seeking situation and become unproductive.

Our paper aims to fill this gap, and it is the first to develop an endogenous growth model very close technically to the Lucas–Uzawa model developed by Lucas (1988) in which the *human capital* defined as the individual's skill level acquired through formal education and learning by doing is replaced by *ethical capital*. In our model, human capital is a part of Ethical capital which is a larger concept embedding both skills and piety. This ethical capital embodied in the individual is an internal power of self-restraint achieved by undertaking continuous religious self-education making the individual obedient to God's Commandments. We focus on Islamic work ethics, which consider work as an act of worship in itself, exhort Muslims on the importance of learning, educating and training themselves to acquire skills, working hard and perfectly, and forbids corruption, deception, and cheating in work. We show that the belief in these Islamic work ethics leads employees not only to acquire skills (increase the human capital level as in Lucas (1988)) but also to work with absolute sincerity for the blessings of God. This will increase their labor productivity and accumulates their *ethical capital*, relaxing the constraint of diminishing returns of physical capital and leading thereby to long-term economic growth. Hence, the study proves that the *ethical capital* based on Islamic work ethics is a key engine of growth embedding both skills (human capital) and piety. The paper is organized as follows. The first section defines and discusses the concepts of *ethical capital* and Islamic work ethics. The second section develops the theoretical model and shows how Islamic work ethics do generate endogenous economic growth. The third section discusses the results and concludes.

### *Islamic work ethics*

Islam is a religion of worship that considers a person who struggles to provide for his family as someone striving in the "way of Allah" with all the rewards attached to this effort. The prophet said, "*never does a Muslim plant tree or cultivate land and birds or a man or a beast eat out of them, but that is a charity on his behalf.*" Thus, work is considered as an act of worship in itself. The Muslim scholar Imam Al-Ghazali mentioned that Jesus (peace and blessings be upon him) once saw a man who had completely devoted himself to worship. When he asked him how he got his daily bread, the man replied that his brother, who worked, provided him with food. Jesus then told him, "That brother of yours is more religious than you are."

In Islamic teachings, working is necessary for social welfare. As Prophet Muhammad said, "*no food is better to man than that which he earns through his manual work*" (see Sahih al-Bukhari, 2072).

In addition, Islam forbids laziness, voluntary unemployment, relying on others for handouts, time-wasting and unproductive activities (see Yousef, 2001). The Prophet Muhammad, who is a paragon of virtues, used to pray, seeking God's refuge from idleness

and laziness. He also said, “No doubt, you had better gather a bundle of wood and carry it on your back (and earn your living thereby) rather than ask somebody who may give you or not”.

In exhorting Muslims on the importance of working hard, The Prophet’s Companion `Umar ibn Al-Khattab said, “Never should anyone of you think that du ‘aa’ (supplication) for sustenance without work will avail him, for heaven never rains gold nor silver”.

Islam makes it an obligation for Muslim, not only to work hard but also to complete his work in order, discipline, accuracy and to do it to the best of his ability (Bayu Taufiq *et al.*, 2013). The Prophet said: “Allah loves those workers who perform their work to the best of their abilities”. (Al-Bayhaqi, Sya’bu al-Iman, no. hadith 4,931.)

To do the job perfectly Muslims should strive for education and learning to acquire knowledge and skills. Knowledge (ilm) occupies a significant position within Islam, as evidenced by the Koran and Sunnah. The Prophet Muhammad declared:

*One who treads a path in search of knowledge has his path to Paradise made easy by God.* (Riyadh us-Saleheen). In addition, Muslims should seek not only to gain knowledge but to share it with others. The Prophet Muhammad said: “Inquire knowledge and impart it to the people.” (Al-Tirmidhi, 107)

The Islamic religion also clearly forbids deception and cheating in work. In the Qur’an, Allaah has condemned cheating. He said: “Woe to Al-Mutaffifoon (those who give less in measure and weight). Those who, when they have to receive by measure from men, demand full measure and when they have to give by measure or weight to (other) men, give less than due” [al-Mutaffifeen 1]. This is a sufficient warning against cheating in weights and measures and a sufficient deterrent against indulging in this heinous sin. Similarly, The Prophet passed by a pile of food and put his hand into it, and his fingers touched something wet. He said, “What is this, O seller of the food?” The man said, “It got rained on, O Messenger of Allaah.” He said, “Why did you not put it (the wet part) on top of the pile so that the people could see it? He who deceives does not belong to me.” According to other reports, “He who deceives us is not one of us”.

These are severe warnings to those who deceive others about the quality of a good or its weight, quantity, measure or components. So how about those who steal, embezzle and corrupt? Islam prohibits corruption and bribery through which the giver obtains much more than what the economic system can provide in the form of goods or services. The Prophet said:

" لعن الله الراشي و المرتشي "

*May God curse the briber, and the bribed.*” reported by At-Tirmidhi graded Sahih (authentic).

Also, Islam forbids “Ghulul,” which is all what employees or officials take illegally, no matter how valuable are misappropriated things. The Prophet said:

" لَا تَغْلُوا؛ فَإِنَّ الْغُلُوبَ نَارٌ وَعَارٌ عَلَىٰ أَصْحَابِهِ فِي الدُّنْيَا وَالْآخِرَةِ "

*Ghulul will be like fire and a cause of disgrace to those who are guilty of it in this world and the Hereafter.*” Related by An-Nasa’i, and Ibn Hibban graded it as Sahih (authentic).

The Prophet also said:

" مَنْ اسْتَعْمَلَنَا عَلَىٰ عَمَلٍ فَرَزَقْنَاهُ رِزْقًا فَمَا أَخَذَ بَعْدَ ذَلِكَ فَهُوَ غُلُولٌ "

When we appoint someone to an administrative post and provide him with an allowance, anything he takes beyond that is unfaithful dealing (Ghulul). In Sahih (Al-Albani)

As a conclusion for this section, a Muslim employee should do the job sincerely, perfectly and without any deception, cheating or corruption and his employer should pay him fairly and immediately (before his sweat dries). Both the employer and the employee should not wrong

each other and show justice and kindness in their relationship. Otherwise, injustice to working class would lead to discontentment, frustration, agitation and strikes (Azid *et al.* 2013). Both of them should make sure that they cater and pay due attention to the highest authority (Azid 2005). This taqwa (piety) attitude should translate all these Islamic ethics into practical realities. Muslims should be pious, i.e. follow all the above orders and leave all prohibitions, and have a sense of self-control and responsibility while having the entire conviction that they are under the continuous supervision of God without the need for any human supervisor. Indeed, God says:

[بِعَلْمِ خَائِنَةَ الْأَعْيُنِ وَمَا تُخْفِي الصُّدُورَ] ( غافر : 19 )

[(Allah) knows of (the tricks) that deceive with the eyes, and all that the hearts (of men) conceal]. Al-Ghaafir/The Forgiver: 19

[لِتَعْلَمُوا أَنَّ اللَّهَ عَلَىٰ كُلِّ شَيْءٍ قَدِيرٌ وَأَنَّ اللَّهَ قَدْ أَحَاطَ بِكُلِّ شَيْءٍ عِلْمًا] ( الطلاق : 12 )

[that you may know that Allah has power over all things, and that Allah comprehends, all things in (His) Knowledge]. At-Talaq/Divorce: 12

All people, and not only Muslims, shall be pious. God says:

[وَلَقَدْ وَصَّيْنَا الَّذِينَ أُوتُوا الْكِتَابَ مِن قَبْلِكُمْ وَإِيَّاكُمْ أَنِ اتَّقُوا اللَّهَ] ، النساء : 131

[Verily we have directed the People of the Book before you, and you (o Muslims) to fear Allah]. An-Nisaa/The Women (131)

Finally, belief in God, when it translates into a renunciation of evil and sins, is rewarded (materially and psychologically) in the present life and in the Hereafter. God promised pious individuals who obey His commandments to increase their economic well-being. At the individual level, the Almighty said:

[...وَمَنْ يَتَّقِ اللَّهَ يَجْعَلْ لَهُ مَخْرَجًا (2) وَيَرْزُقْهُ مِنْ حَيْثُ لَا يَحْتَسِبُ...] ( الطلاق : 2-3 )

[... and for those who fear Allah, He (ever) prepares a way out, and He provides for him from (sources) he never could imagine]. At-Talaq/Divorce:2-3

At the community (or aggregate) level, the Almighty said:

[وَلَوْ أَنَّ أَهْلَ الْقُرَىٰ آمَنُوا وَاتَّقَوْا لَفَتَحْنَا عَلَيْهِم بَرَكَاتٍ مِّنَ السَّمَاءِ وَالْأَرْضِ ...] ( الأعراف : 96 )

[If the people of the towns had but believed and feared Allah, We should indeed have opened out to them (All kinds of) blessings from heaven and Earth] Al-A'raaf/The Heights (96)

Although it is difficult to demonstrate with figures in hand this causality relationship, Muslims must believe in its existence and robustness at both the individual and collective levels, as it is argued in Qur'an and the Prophetic Narration. According to Ahmad Raja *et al.* (2018) and Akhtar *et al.* (2018), both Muslim employer and the employee are obliged to implement the Islamic work ethics as an act of worshiping God, i.e. work with sincerity for the blessings of Allah and the betterment of the organization. This leads the business to prosper and the national wealth to increase. We aim in the following section to model this positive relationship between Islamic work ethics and economic growth and prove its existence theoretically.

### *The model*

We consider an economy with a production sector and a representative firm that produces according to the following Cobb–Douglas function:



$$Y = AK^\alpha E^{1-\alpha} \quad (1)$$

$Y$  is the output of goods,  $A$  is a positive constant technological parameter,  $K$  is the input of physical capital and  $E$  is the input of *ethical capital*, all at time  $t$ .  $0 < \alpha < 1$  means that each firm produces at constant returns to scale in  $K$  and  $E$ . *The ethical capital*, defined as the individual's degree of belief in Islamic work ethics and the self-discipline to obey God's commandments, is acquired through the individual's Islamic self-education. To simplify, we assume that all individuals are identical and have the same ethical capital. The ethical capital,  $E$ , is the number of workers,  $L$ , (quantity), multiplied by the piety level (quality) of the typical worker,  $e$  ( $E = L \cdot e$ ). We assume that the total labor force,  $L$ , is fixed, and  $E$  grows with the piety level,  $e$ . Thus, there are two kinds of capital, or state variables, in our model: physical capital  $K$  that is accumulated and utilized in production under the neoclassical technology, and ethical capital  $E$  that increases the productivity of labor and physical capital. Contrarily to the physical capital, the ethical capital is embodied in an individual and is not a tangible thing that can immediately be transferred to others.

In the Lucas–Uzawa model, the human capital,  $H$ , defined by the individual's skills, is acquired through formal training and education activities, which occur in the non-leisure time simultaneously with the production activity. Then the use of human capital in one sector precludes its use in the other sector. That's why in their model, the individual devotes the fraction,  $u$ , of his non-leisure time to production, and the remaining fraction,  $1 - u$ , is devoted to human capital accumulation. However, in our model, the individual devotes the whole non-leisure time to production because the Islamic self-education activity should occur in the free time. The Prophet said: *“There are two blessings, and most people evaluate these blessings incorrectly: Health and free time.”* [Bukhari, *Al-Riqaq (Heart Melting Traditions)*; 1]. Indeed, the best time to increase piety, i.e. to pray, to recite and study the Holy Quran – The word of Allah and the book of guidance revealed to the Prophet Muhammad-is at night until the dawn. God said:

« كَانُوا قَلِيلًا مِنَ اللَّيْلِ مَا يَهْجَعُونَ وَبِالْأَسْحَارِ هُمْ يَسْتَغْفِرُونَ » (الذاريات (18,17))

They used to sleep little at night (invoking their Lord and praying, with fear and hope) And in the hours before dawn, they were (found) asking forgiveness from Allah. Azzariyaat 17,18

The Almighty also said:

« أَقِمِ الصَّلَاةَ لِدُلُوكِ الشَّمْسِ إِلَى غَسَقِ اللَّيْلِ وَقُرْآنَ الْفَجْرِ إِنَّ قُرْآنَ الْفَجْرِ كَانَ مَشْهُودًا » (الاسراء (78))

Establish prayer at the dusk until the darkness of the night and the Quran of the dawn. Indeed, the recitation of Quran in the dawn is witnessed by angels. – Surah Al-Israa (78).

In addition, one of the most strongly emphasized duties in Islam, “Jumah” or Friday prayer, is the best way for a Muslim to educate himself and accumulate his ethical capital. Indeed, Friday congregational prayer includes a sermon given by a Muslim clergy member. During this prayer, worshippers listen to a lecture that explains Islam principles and reminds them of God's commandments. The Qur'an invokes the importance of “Jumah”:

« يَا أَيُّهَا الَّذِينَ آمَنُوا إِذَا نُودِيَ لِلصَّلَاةِ مِنْ يَوْمِ الْجُمُعَةِ فَاسْعَوْا إِلَى ذِكْرِ اللَّهِ وَذَرُوا الْبَيْعَ ذَلِكُمْ خَيْرٌ لَكُمْ إِنْ كُنْتُمْ تَعْلَمُونَ ” (الجمعة (9))

O you who believe! When you are called to congregational (Friday) prayer, hasten to the remembrance of God and leave off trade and business. That is best for you, if you but knew. Al-Jumah (9)

According to the Prophet Muhammad, Muslims who miss three Friday prayers in a row, without a valid reason, stray from the straight path and risks becoming disbelievers. That's

why the majority of Islamic countries include Friday as part of the weekend. In non-Muslim countries, jurists have allowed Muslims to miss Friday prayer due to office hours since work is necessary for earning their living.

Muslims should also strive for education and learning to acquire skills. The Prophet said: “*The seeking of knowledge is obligatory for every Muslim.*” (Al-Tirmidhi, 74). They should spend their leisure time in a meaningful way such as taking part-time courses at night or on weekends or opting for distance or online learning, etc. . . .

Finally, not only ethical capital development is taking place in free time but the nature of ethical capital is such that it is transferable for use in any sector. It is not sector-specific skill. Moreover, the ethical capital grows with practice of ethics, and the opportunities to practice ethics exist during work time as well as in free time.

Thus, we assume, as in the Lucas–Uzawa model, that the Islamic self-education activity is intensive only in ethical capital,  $E$  which grows according to:

$$\dot{E} = BE - \delta_E E \quad (2)$$

where  $B$  is a positive technological parameter and  $\delta_E$  is the rate of depreciation of ethical capital. Dividing (2) by  $E$  gives the expression for the growth rate of  $E$ :

$$\dot{E}/E = B - \delta_E \quad (3)$$

The physical capital grows according to:

$$\dot{K} = Y - C - \delta_k K \quad (4)$$

$C$  is consumption and  $\delta_k$  is the depreciation rate of physical capital. Contrarily to the Lucas–Uzawa model, we assume, in our model, that the depreciation rates for physical and ethical capital are different,  $\delta_k \neq \delta_E$  since this generalization will not complicate the algebra.

To facilitate the dynamic analysis we use the ratios  $\omega \equiv K/E$  and  $\chi \equiv C/K$ .

These definitions combined with Eqns (1) and (4), give the expression for the growth rate of  $K$ :

$$\dot{K}/K = A\omega^{\alpha-1} - \chi - \delta_k \quad (5)$$

and the growth rate of  $\omega$ :

$$\begin{aligned} \dot{\omega}/\omega &= \dot{K}/K - \dot{E}/E \\ &= A\omega^{\alpha-1} - \chi - \delta_k - B + \delta_E \end{aligned} \quad (6)$$

The first-order conditions give the consumption growth rate:

$$\dot{C}/C = (r - \rho)/\theta \quad (7)$$

For a given  $E$ , each firm maximizes its profit by equating the marginal product of capital to the rental price,  $r + \delta_k$ . Eqn (1) gives:

$$\partial Y/\partial K = \alpha AK^{\alpha-1} E^{1-\alpha} = r + \delta_k \quad (8)$$

Using the ratio  $\omega \equiv K/E$  gives:

$$r = \alpha A\omega^{\alpha-1} - \delta_k \quad (9)$$



Therefore, the growth rate of consumption in Eqn (7) becomes:

$$\dot{C}/C = (\alpha A \omega^{\alpha-1} - \delta_k - \rho)/\theta \quad (10)$$

Eqns (5) and (10) give the growth rate of  $\chi$  as:

$$\begin{aligned} \dot{\chi}/\chi &= \dot{C}/C - \dot{K}/K \\ &= \chi + [A \omega^{\alpha-1}(\alpha - \theta) - \delta_k(1 - \theta) - \rho]/\theta \end{aligned} \quad (11)$$

### Steady-state analysis

In the steady-state, the variables  $\omega$  and  $\chi$  are constant, which corresponds to  $\dot{\omega} = \dot{\chi} = 0$ . Then setting Eqns (6) and (10) to zero (see Appendix) gives the rate of return  $r^*$ ,  $\omega^*$  and  $\chi^*$ , in the steady-state:

$$r^* = (B - \delta_E)\theta + \rho \quad (12)$$

The common long-run growth rate of  $C$ ,  $K$ ,  $E$  and  $Y$  becomes in this steady-state  $g^* = (r^* - \rho)/\theta$ . Replacing  $r^*$  by Eqn (12) gives:

$$g^* = B - \delta_E \quad (13)$$

We know that the long-run growth rate in the Lucas–Uzawa model is given by  $g_{Lu}^* = (B - \delta_H - \rho)/\theta$ . Thus Eqn (13) shows that similarly to  $g_{Lu}^*$ , the parameter  $\alpha$  has no effect on our long-run growth rate,  $g^*$ . This feature is due to the rather special assumption that no physical capital (output from manufacturing) is applied in the religious self-education activity, which, therefore, alone constitutes the “growth engine” in both models.

In addition, in the Lucas–Uzawa model the growth rate  $g_{Lu}^*$  is an increasing function of the net productivity  $B - \delta_H$ , in the “educational sector” and a decreasing function of the pure rate of impatience,  $\rho$ . This means that a decrease in this parameter leads to a drop in current consumption and thus stimulates physical and human capital investments leading to a permanently higher growth rate. However, in our model the long-run growth rate  $g^*$ , equals the net productivity  $B - \delta_E$ , in the religious self-education activity, which means that only the ethical capital does matters for the long-run economic growth.

Finally, as in the Lucas–Uzawa model, the transversality condition  $r^* \geq g^*$ , ensures that  $\omega^*$  and  $\chi^*$  showed in the Appendix are both positive. Eqns (12) and (13) imply that:

$$r^* \geq g^* \Rightarrow \frac{\rho}{(1 - \theta)} \geq (B - \delta_E) \quad (14)$$

To compare the growth rates in the Lucas–Uzawa model,  $g_{Lu}^*$  with the our  $g^*$ , we first assume the same depreciation rates in both models,  $\delta_H = \delta_E = \delta$  and then we calculate the difference,  $g^* - g_{Lu}^*$ . This yields:

$$\begin{aligned} g^* - g_{Lu}^* &= (B - \delta) - (B - \delta - \rho)/\theta \\ &= \frac{\rho - (B - \delta)(1 - \theta)}{\theta} \geq 0 \end{aligned} \quad (15)$$

Thus, condition (14) implies that  $g^* - g_{Lu}^* \geq 0$ , which means that the growth rate in our model is higher than that of the Lucas–Uzawa model. The intuition behind this result is the

following: In the Lucas–Uzawa model, the individual spends some time in production and some time in formal education, so the opportunity cost of producing human capital is the manufacturing output forgone, which society hereby loses. This opportunity cost is absent in our model since the religious self-education occurs in the individual's free time while the non-leisure time is fully devoted to production, thereby leading to a higher growth rate. We thus prove theoretically that ethical capital is a key engine of endogenous economic growth. The accumulation of this ethical capital (an increase of individual piety and skill) generates a higher long-term economic growth rate as given by condition (14). This result proves the promise of God, in Qur'an and the Prophetic Narration, for pious individuals and societies and argues that the underdevelopment of Muslim populations is not due to their belonging to Islam in itself, but because of their lack of piety (low ethical capital) required in that religion. Indeed, Hussain (2007) stated that Muslims do not develop an in-depth understanding of Islam. They recite and memorize the Holy Quran without comprehending its meanings, which creates a gap between the theory and practice of Islamic management in Arab countries, as argued by Branine and Pollard (2010). Similarly, Mitroff (2003) has shown that, in general, employees are physically present, while their souls are absent from the organization (Mitroff, 2003). As a result, Rego *et al.* (2008) conclude that employees fail to develop themselves as holistic human beings, and the organization does not trigger their employees' full potential and creativity, as stated by Hoque *et al.* (2013).

### Conclusion

Many studies focused on Islam's effect on economic growth without reaching a consensus on whether this effect is positive or negative. Indeed, some authors show that Islam promotes economic growth. Conversely, some others state that it harms economic growth. In this paper, we show that religion does matter for economic growth. More precisely, what really matters is not the simple belonging to a given religion, but the degree of belief in that religion and the self-discipline to obey its commandments, which we called *Ethical Capital* embodied in the individual. We consider in this paper, The Islamic religion which exhorts Muslim employees to do the job for what they are paid for sincerely, perfectly and without any deception, cheating or corruption and to have a sense of self-control and responsibility while having the entire conviction that they are under the continuous supervision of God without the need for any human supervisor. We developed an endogenous growth model very close technically to the Lucas–Uzawa model, where the growth generating activity (the “growth engine”) is *Ethical capital* accumulation through Islamic self-education activity. In the Lucas–Uzawa model, the individual spends some time in production and some time in formal education to accumulate human capital. However, in our model, Islamic self-education activity occurs in the individual's free time while the non-leisure time is fully devoted to production, leading thereby to a higher long-run growth rate. This result proves that Islam promotes economic growth and that Muslim populations' underdevelopment is due to their low ethical capital (lack of piety). Consequently, our study recommends some policies such as providing formal religious education at all educational levels (elementary, secondary and higher levels) and promoting ethical values such as piety, sincerity, transparency, etc., through media and cultural institutions. Also, managers could provide courses and training to their workers to teach them Islamic work ethics.

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### Further reading

Esen, M.F. (2015), "A statistical framework on identification of Maqasid Al-Shariah Variables for socio-economic development index", *Journal of Business Studies Quarterly*, Vol. 7 No. 1, p. 107.

### Appendix

$$\dot{\omega}/\omega = 0 \Rightarrow A\omega^{\alpha-1} - \chi - \delta_k - B + \delta_E = 0 \quad (16)$$

and

$$\dot{\chi}/\chi = 0 \Rightarrow \chi + [A\omega^{\alpha-1}(\alpha - \theta) - \delta_k(1 - \theta) - \rho]/\theta = 0 \quad (17)$$

(16) implies:

$$A\omega^{*\alpha-1} = \chi^* + \delta_k + B - \delta_E \quad (18)$$

and (17) means:

$$A\omega^{*\alpha-1} = \chi^* + \delta_k + (\alpha A\omega^{*\alpha-1} - \delta_k - \rho)/\theta \quad (19)$$

(18) and (19) imply that

$$(\alpha A\omega^{*\alpha-1} - \delta_k - \rho)/\theta = B - \delta_E$$

Remind that according to (9) we have  $\alpha A\omega^{*\alpha-1} - \delta_k = r^*$ . This means that

$$\begin{aligned} r^* &= (B - \delta_E)\theta + \rho \\ \chi^* &= \frac{((B - \delta_E)(\theta - \alpha) + \delta_k(1 - \alpha) + \rho)}{\alpha} \\ \omega^* &= \left( \frac{(B - \delta_E)\theta + \delta_k + \rho}{\alpha A} \right)^{\frac{1}{\alpha-1}} \end{aligned}$$

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